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Microsurgery management of schwannomas: symptom resolution with low neurologic deficits

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Introduction: Schwannomas are the most common tumors of peripheral nerves. It is a tumor with a slow and non-infiltrating pattern growth that usually presents as a painless swelling for several years without any specific symptom, unless the tumor grows greater than 25 mm in diameter. Characteristically, it is an eccentric oval swelling, well encapsulated, less than 30 mm in diameter, with the attenuated nerve bundles (fascicles) of the parent nerve stretched and displaced over the dome of the mass. Microsurgery with enucleation while preserving the nerve function is the standard surgical procedure. En bloc resection should not be performed because the main purpose of schwannoma surgery is the relief of pain and tingling sensations, rather than resection of the tumor itself.
Objectives: This study was conducted to assess the management results of 18 patients with schwannomas treated with microsurgical technique.
Methods: This is a retrospective study of 18 patients treated between 2004 and 2014 with diagnosis of peripheral nervesschwannoma. The diagnosis was established based on clinical criteria and ultrasonography-guided biopsy and confirmed by histological study of the excised specimens. All tumors were located in major nervous structures, except 3: 4 in cubital nerve, 4 in median nerve, 2 in sciatic nerve, 1 in tibial nerve, 1 in superficial fibular nerve, 1 in sacral plexus and 2 in muscular branches of femoral nerve. All schwannomas were excised by careful dissection using microscope: the nerve sheath was incised longitudinally to minimize damage to the nerve fascicles and gentle dissection along the plane of the capsule and epineurium was performed using atraumatic technique allowing the enucleation of the tumor. This dissection plane was relatively easy to preserve in most cases as the central portion of the tumor was not adherent.
Results: The 18 patients presented with pain localized over a palpable mass. The Tinel sign was positive in 15 (83,3%) patients and none of them had sensory deficit, muscle weakness or palsy in the affected area. After surgical treatment, all patients were painless, without neurological deficits. There were no complications or recurrences. Furthermore, there was total concordance between the histological results from biopsy and the results of the specimens after surgery. All the tumors in this study were histological benign and there were no recurrence after the intervention.
Conclusions: A benign schwannoma is associated with a good prognosis, independently of its size. The diagnosis of a schwannoma arising from the extremities is usually straightforward, based upon physical and imaging findings. Tinel/s sign is the single most useful sign in the diagnosis of a schwannoma. However, ultrasonography-guided biopsy has impressive accuracy and it is an essential tool to pre-operative diagnosis, allowing excluding malignancy. Microsurgery with enucleation of the tumor is the standard surgical procedure that allows symptoms resolution and the establishment of definitive diagnosis of schwannoma with very low neurological deficit associated. Recurrence is not usual even when there is only partially resection.

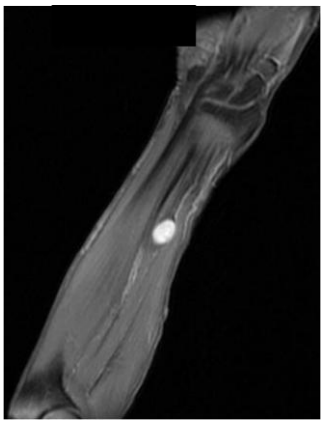

Figure 1. *Median nerve*

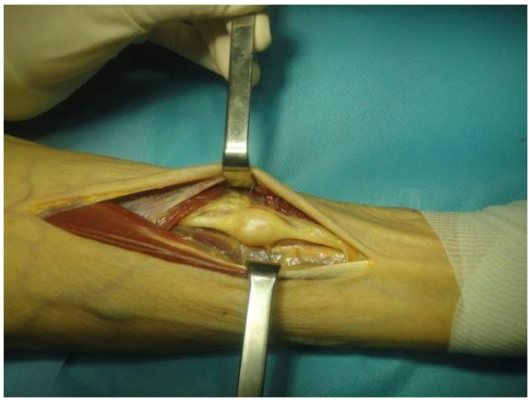

Figure 2. *Microsurgery*

Figure 3. *Microsurgery*

Figure 4. *Cutaneous nerve*

Figure 5. *Cutaneous nerve*

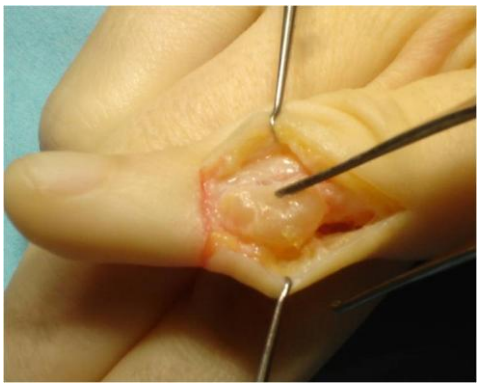

Figure 6. *Microsurgery*

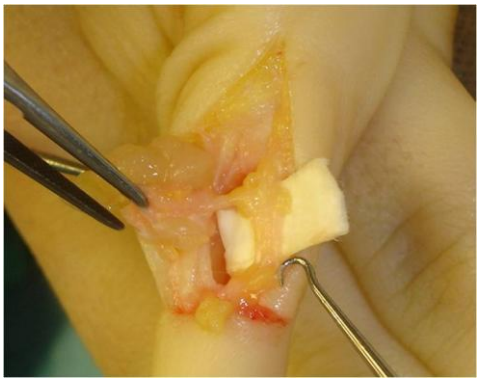

Figure 7. *Microsurgery*

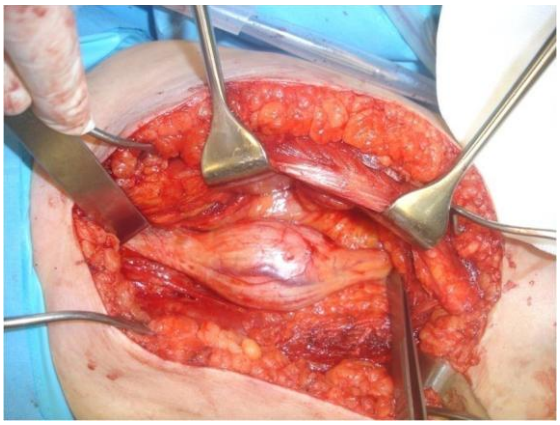

Figure 8. *Sciatic nerve*

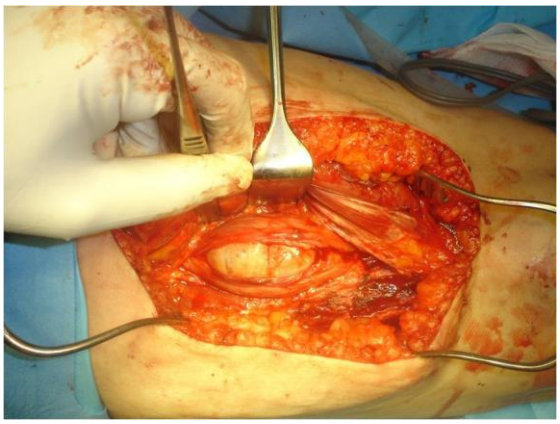

Figure 9. *Sciatic nerve*

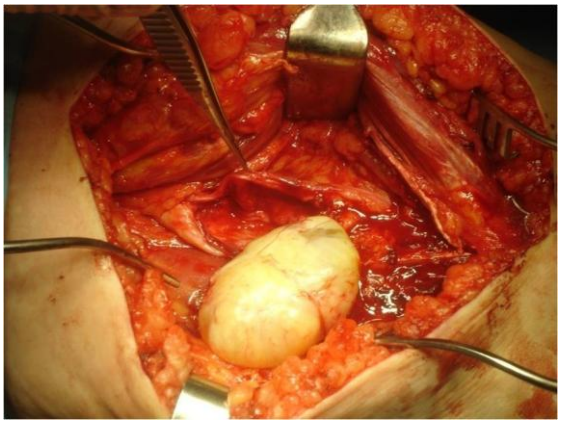

Figure 10. *Sciatic nerve*